



# INSTALLATION, OPERATING & SERVICE MANUAL

## MASTER SERIES HEAVY DUTY RANGES, FRYERS & BROILERS



**FOR YOUR SAFETY:**  
DO NOT STORE OR USE GASOLINE  
OR OTHER FLAMMABLE VAPORS OR  
LIQUIDS IN THE VICINITY OF  
THIS OR ANY OTHER  
APPLIANCE

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**WARNING:**  
IMPROPER INSTALLATION, ADJUSTMENT,  
ALTERATION, SERVICE OR MAINTENANCE  
CAN CAUSE PROPERTY DAMAGE, INJURY,  
OR DEATH. READ THE INSTALLATION,  
OPERATING AND MAINTENANCE  
INSTRUCTIONS THOROUGHLY  
BEFORE INSTALLING OR  
SERVICING THIS EQUIPMENT



PLEASE READ ALL SECTIONS OF THIS MANUAL  
AND RETAIN FOR FUTURE REFERENCE.

THIS PRODUCT HAS BEEN CERTIFIED AS  
COMMERCIAL COOKING EQUIPMENT AND  
MUST BE INSTALLED BY PROFESSIONAL  
PERSONNEL AS SPECIFIED.

For Your Safety:  
Post in a prominent location, instructions to be  
followed in the event the user smells gas. This  
information shall be obtained by consulting  
your local gas supplier.

Users are cautioned that maintenance and repairs must be performed by a Garland authorized service agent using genuine Garland replacement parts. Garland will have no obligation with respect to any product that has been improperly installed, adjusted, operated or not maintained in accordance with national and local codes or installation instructions provided with the product, or any product that has its serial number defaced, obliterated or removed, or which has been modified or repaired using unauthorized parts or by unauthorized service agents. For a list of authorized service agents, please refer to the Garland web site at <http://www.garland-group.com>. The information contained herein, (including design and parts specifications), may be superseded and is subject to change without notice.

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# TECHNICAL SPECIFICATIONS

**Table B: Model Designations**

MODEL	MM	Ins	DESCRIPTION
MST42R(E)	864	34	Range with oven, two open top burners & a 432 mm wide solid hot plate or optional griddle
MST42RC(E)	864	34	Range with convection oven, two open top burners & a 432 mm wide solid hot plate or option griddle
MST42S(E)	864	34	Range with storage compartment, two open top burners & a 432 mm wide solid hot plate optional griddle
MST42T(E)	864	34	Modular top with two open top burners & a 432 mm wide solid hot plate or optional griddle.
MST43R(E)	864	34	Range with oven and six open top burners
MST43RC(E)	864	34	Range with convection oven and six open top burners
MST43S(E)	864	34	Range with storage base and six open top burners
MST43T(E)	864	34	Modular top with six open top burners
MST44R(E)	864	34	Range with oven and four open top burners
MST44RC(E)	864	34	Range with convection oven and four open top burners
MST44S(E)	864	34	Range with storage base and four open top burners
MST44T(E)	864	34	Modular top with four open top burners
MST45R(E)	864	34	Range with oven and two 330 mm wide front fired solid hot plate sections
MST45RC(E)	864	34	Range with convection oven and two 330 mm wide front fired solid hot plate sections
MST45S(E)	864	34	Range with storage base and two 330 mm wide front fired solid hot plate sections
MST45T(E)	864	34	Modular top with two 330 mm wide front fired solid hot plate sections
MST46R(E)	864	34	Range with oven and two 330 mm wide even heat solid top sections
MST46RC(E)	864	34	Range with convection over and two 330 mm wide even heat solid top sections
MST46S(E)	864	34	Range with storage base and two 330 mm wide even heat solid top sections
MST46T(E)	864	34	Modular top with two 330 mm wide even heat solid top sections
MST47R(E)	864	34	Range with oven and 864 mm wide tap controlled griddle
MST47RC(E)	864	34	Range with convection oven and 864 mm wide tap controlled griddle
MST47S(E)	864	34	Range with storage base and 864 mm wide tap controlled griddle
MST47T(E)	864	34	Modular top and 864 mm wide tap controlled griddle
MST54R(E)	864	34	Range with oven, two open top burners & a 330 mm wide front fired solid top section
MST54RC(E)	864	34	Range with convection oven, two open top burners & a 330 mm wide front fired solid top section
MST54S(E)	864	34	Range with a storage base, two open top burners & a 330 mm wide front fired solid top section
MST54T(E)	864	34	Modular top with two open top burners & a 330 mm wide front fired solid top section

# TECHNICAL SPECIFICATIONS continued

MODEL	MM	Ins	DESCRIPTION
MST4S(E)	432	17	Range with storage base and two open top burners
MST4T(E)	432	17	Modular top with two open top burners
MST6S(E)	432	17	Range with 330 mm wide solid hot plate
MST6T(E)	432	17	Modular top with 330 mm wide solid hot plate
MST7S(E)	432	17	Range with 330 mm wide tap controlled griddle
MST7T(E)	432	17	Modular top with 330 mm wide tap controlled griddle
MST17B(E)	432	17	Char broiler
MST24BT(E)	610	24	Char broiler
MST34BT(E)	864	34	Char broiler
MST35	432	17	Deep fat fryer
MST70	610	24	Deep fat fryer

### PREFIX DEFINITIONS:

MST Master Sentry c/w total flame failure

### SUFFIX DEFINITIONS:

E Electric spark pilot ignition  
 B Broiler  
 T Modular top section  
 S Storage cabinet under top section  
 RC Range with convection oven  
 R Range with standard oven

# TECHNICAL SPECIFICATIONS continued

**Table C: Exterior Dimensions**

MODELS	HEIGHT		WIDTH		DEPTH		WEIGHT	
	mm	ins.	mm	ins.	mm	ins.	kg	lb
MST42R(E) & RC(E)	952.5	37.5	863.6	34	965.2	38	235.9	520
MST42S(E)	952.5	37.5	863.6	34	965.2	38	222.3	490
MST42T(E)	317.5	12.5	863.6	34	965.2	38	99.8	220
MST43R(E) & RC(E)	882.6	34.75	863.6	34	965.2	38	213.2	470
MST43S(E)	882.6	34.75	863.6	34	965.2	38	158.8	350
MST43T(E)	247.6	9.75	863.6	34	965.2	38	99.8	220
MST44R(E) & RC(E)	882.6	34.75	863.6	34	965.2	38	231.4	510
MST44S(E)	882.6	34.75	863.6	34	965.2	38	176.9	390
MST44T(E)	247.6	9.75	863.6	34	965.2	38	108.9	240
MST45R(E) & RC(E)	869.9	34.25	863.6	34	965.2	38	254.1	560
MST45S(E)	369.9	34.25	863.6	34	965.2	38	199.6	440
MST45T(E)	234.9	9.25	863.6	34	965.2	38	136.1	300
MST46R(E) & RC(E)	869.9	34.25	863.6	34	965.2	38	240.5	530
MST46S(E)	869.9	34.25	863.6	34	965.2	38	186	410
MST46T(E)	234.9	9.25	863.6	34	965.2	38	115.7	255
MST47R(E) & RC(E)	952.5	37.5	863.6	34	965.2	38	242.7	535
MST47S(E)	952.5	37.5	863.6	34	965.2	38	188.2	415
MST47T(E)	317.5	12.5	863.6	34	965.2	38	117.9	260
MST54R(E) & RC(E)	882.6	34.75	863.6	34	965.2	38	235.9	520
MST54S(E)	882.6	34.75	863.6	34	965.2	38	181.5	400
MST54T(E)	247.6	9.75	863.6	34	965.2	38	122.5	270
MST4S(E)	882.6	34.75	431.8	17	965.2	38	95.3	210
MST4T(E)	317.5	12.5	431.8	17	965.2	38	59	130
MST6S(E)	882.6	34.75	431.8	17	965.2	38	99.8	220
MST6T(E)	234.9	9.25	431.8	17	965.2	38	54.5	120
MST7S(E)	952.5	37.5	431.8	17	965.2	38	113.5	250
MST7T(E)	317.5	12.5	431.8	17	965.2	38	61.3	135
MST17B	1092.2	43	431.8	17	965.2	38	100	220
MST24B	1092.2	43	609.6	24	965.2	38	149.7	330
MST34B	1092.2	43	863.6	34	965.2	38	231.4	510
MST35F	793.7	31.25	431.8	17	965.2	38	86.2	190
MST70F	793.7	31.25	609.6	24	965.2	38	120.2	265

NOTE: Height dimensions are specified with 4 inch (101.6mm) legs. Add 2 inches (50.8mm) for 6 inch legs.

# TECHNICAL SPECIFICATIONS continued

**Table D: Gas Flow Rate (Net) Per Model**

MODEL	2nd Family (m3/h) NET		3rd Family (kg/h)
	G20 @ 20mbar	G25 @ 25mbar	G31 @ 37/50mbar
MST42R(E) & RC(E)	2.99	3.47	2.24
MST42S(E) & T(E)	1.87	2.18	1.4
MST43R(E) & RC(E)	5.14	5.97	3.35
MST43S(E) & T(E)	4.02	4.68	2.51
MST44R(E) & RC(E)	4.47	5.19	3.35
MST44S(E) & T(E)	3.35	3.9	2.51
MST45R(E) & RC(E)	3.35	3.9	2.51
MST45S(E) & T(E)	2.24	2.6	1.68
MST46R(E) & RC(E)	3.38	3.93	2.54
MST46S(E) & T(E)	2.26	2.63	1.70
MST47R(E) & RC(E)	3.63	4.22	2.72
MST47S(E) & T(E)	2.51	2.92	1.89
MST54R(E) & RC(E)	3.21	3.73	2.41
MST54S(E) & T(E)	2.09	2.43	1.57
MST45(E) & T(E)	1.12	1.30	0.84
MST6S(E) & T(E)	0.76	0.88	0.57
MST7S(E) & T(E)	0.76	0.88	0.57
MST17B(E)	1.26	1.46	0.94
MST24B(E)	1.67	1.95	1.26
MST34B(E)	2.51	2.92	1.89
MST35F	3.07	3.57	2.31
MST70F	3.49	4.06	2.62

# TECHNICAL SPECIFICATIONS continued

**Table E: Heat Input (Gross) Per Burner / Burner Group**

MODELS / SECTION	2nd Family, Groups H,L & E		3rd Family, Group 3P	
	(G20/G25 @ 20/25 mbar) Nat Gas		(G31 @ 37/50 mbar) Propane	
	Per burner / section		Per burner / section	
	kW	MJ/HR	kW	MJ/HR
MST40(E) Oven	11.72	42.2	11.72	42.20
MST40RC(E) Oven	11.72	42.2	10.3	36.90
MST42(E) Open Top	5.86	21.1	5.86	21.10
MST42(E) Solid Top/Griddle	7.91	28.48	7.91	28.48
MST43(E) Open Top	7.03	25.32	5.86	21.10
MST44(E) Open Top	8.79	31.65	8.79	31.65
MST45(E) Solid Top	11.72	42.2	11.72	42.20
MST46(E) Solid Top	7.91	28.48	7.91	28.48
MST47(E) Griddle	8.79	31.65	8.79	31.65
MST54(E) Solid Top	10.25	36.92	10.25	36.92
MST54(E) Open Top	5.86	21.1	5.86	21.10
MST4(E) Open Top	5.86	21.1	5.86	21.10
MST6(E) Solid Top	7.91	28.48	7.91	28.48
MST7(E) Griddle	7.91	28.48	7.91	28.48
MST17B(E) Broiler	8.79/4.39	31.65/ 15.82	8.79/4.39	31.65/ 15.82
MST24B(E) Broiler	8.79	31.65	8.79	31.65
MST34B(E) Broiler	8.79	31.65	8.79	31.65
MST35F Fryer	32.23	116.04	32.23	116.04
MST70F Fryer	36.63	131.86	36.63	131.86



# TECHNICAL SPECIFICATIONS continued

**Table F: Pressure Setting / Injector Size**

MODEL/SECTION	2nd Family, Groups H, L & E						3rd Family, Group 3P					
	Setting Pressure				Injector Size		Setting Pressure		Injector Size			
	G20 @ 20 mbar		G25 & 25 mbar				G31 @ 37/50 mbar		37 mbar		50 mbar	
	mbar	"WC	mbar	"WC	DMS	mm	mbar	"WC	DMS	mm	DMS	mm
MST42(R,RC,S & T)(E)	20	8.0	25	10	-	-	37/50	14.8/20	-	-	-	-
MST43(R,RC,S & T)(E)	20	8.0	25	10	-	-	37/50	14.8/20	-	-	-	-
MST44(R,RC,S & T)(E)	20	8.0	25	10	-	-	37/50	14.8/20	-	-	-	-
MST45(R,RC,S & T)(E)	20	8.0	25	10	-	-	37/50	14.8/20	-	-	-	-
MST46(R,RC,S & T)(E)	20	8.0	25	10	-	-	37/50	14.8/20	-	-	-	-
MST47(R,RC,S & T)(E)	20	8.0	25	10	-	-	37/50	14.8/20	-	-	-	-
MST54(R,RC,S & T)(E)	20	8.0	25	10	-	-	37/50	14.8/20	-	-	-	-
MST4(S & T)(E)	20	8.0	25	10	-	-	37/50	14.8/20	-	-	-	-
MST6(S & T)(E)	20	8.0	25	10	-	-	37/50	14.8/20	-	-	-	-
MST7(S & T)(E)	20	8.0	25	10	-	-	37/50	14.8/20	-	-	-	-
MST40(E) Oven	-	-	-	-	31	2.65	-	-	50	1.78	53	1.5
MST40RC(E) Oven	-	-	-	-	31	2.65	-	-	50	1.6	53	1.5
MST42(E) Open Top	-	-	-	-	-	-	-	-	-	-	-	-
MST42(E) Solid Top/Griddle	-	-	-	-	45	2.08	-	-	1.4	1.4	1.2	1.2
MST43(E) Open Top	-	-	-	-	1.9	1.9	-	-	1.3	1.3	1.2	1.2
MST44(E) Open Top	-	-	-	-	-	-	-	-	-	-	-	-
MST45(E) Solid Top	-	-	-	-	1.4	1.4	-	-	63	0.95	66	0.85
MST46(E) Solid Top	-	-	-	-	45	2.08	-	-	1.4	1.4	1.25	1.2
MST47(E) Griddle	-	-	-	-	44	2.18	-	-	53	1.51	1.35	1.3
MST54(E) Solid Top	-	-	-	-	-	-	-	-	-	-	-	-
MST54(E) Open Top	-	-	-	-	-	-	-	-	-	-	-	-
MST17B(E) Broiler	20	8.0	25	10	1.5	1.5	37/50	14.8/20	60	1.02	63	0.95
MST24B(E) Broiler	20	8.0	25	10	1.5	1.5	37/50	14.8/20	60	1.02	63	0.95
MST34B(E) Broiler	20	8.0	25	10	1.5	1.5	37/50	14.8/20	60	1.02	63	0.95
MST35F Fryer	10.5	4.2	N/A	N/A	1.7	1.7	22.4	9.0	1.0	1.0	1.0	1.0
MST70F Fryer	10.5	4.2	N/A	N/A	1.2	1.2	22.4	9.0	0.82	0.82	0.82	0.82

# TECHNICAL SPECIFICATIONS continued

**Table G: Pressure Setting For Low Tap Position**

MODELS/SECTION	2nd Family, Groups H, L & E		3rd Family, Group 3P	
	G20/G25 @ 20/25 mbar Natural Gas		G31 @ 37/50 mbar Propane	
	mbar		mbar	
MST40(E) Oven	1.2		1.2	
MST42(E) Hot Top	2.0		3.0	
MST42(E) Griddle	2.0		3.0	
MST45(E) Hot Top	3.7		11.0	
MST46(E) Hot Top	2.0		3.0	
MST47(E) Griddle	2.0		3.0	
MST54(E) Hot Top	-		-	
MST6(E) Hot Top	2.0		3.0	
MST7(E) Griddle	2.0		3.0	
MST(17,24,34)(E) Broiler	2.0		7.0	

**Table H: Aeration Shutter Setting / Pilot Flame Length**

SECTION	2nd Family, Groups H, L & E		3rd Family, Group 3P		Pilot Flame Length	
	G20/G25 @ 20/25 mbar Natural Gas		G31 @ 37/50 mbar Propane			
	mm	Ins.	mm	Ins.	mm	Ins.
Oven	41.3	1.625	42.9	1.688	12.7	0.5
Open Burner	22.0	0.875	25.4	1.0	12.7	0.5
Griddle	25.4	1.0	26.9	1.062	12.7	0.5
Hot Top	25.4	1.0	19	0.75	12.7	0.5
Front Fired Hot Top	26.9	1.062	25.4	1.0	12.7	0.5
Broiler	25.4	1.0	25.4	1.0	12.7	0.5
Fryer	N/A	N/A	N/A	N/A	12.7	0.5

# TECHNICAL SPECIFICATIONS continued

**Table I: Australia Only Nominal Gas Consumption & Injector Sizes**

MODEL/SECTION	NATURAL GAS			PROPANE GAS		
	INJ.DIA mm.	MJ/H	Gas Pressure (kPa)	INJ.DIA mm	MJ/H	Gas Pressure (kPa)
Standard Oven	3.25	42.20	1.0	1.70	36.90	2.49
Convection Oven	3.20	36.90	1	1.70	36.90	2.49
MST43 Open Top	2.35	25.30	1	1.40	21.10	2.49
MST4, 44 Open Top	2.64	36.90	1	1.78	36.90	2.49
MST5, 45 Front Fired Hot Top	1.70	12.30	1	1.07	12.30	2.49
MST6, 46 Even Heat Hot Top	2.85	28.50	1	1.51	28.50	2.49
MST7, 47 Griddle	3.05	31.65	1	1.70	31.65	2.49
MST17,24,30,34B	1.90	33	1	1.15	33	2.49

**Table J: Clearances**

CLEARANCE FROM COMBUSTIBLE CONSTRUCTION					
Model	Sides		Rear		Base
	mm	Ins.	mm	Ins.	
MST43(R,RC,S,E)	280	11	152	6	Combustible
MST43T	280	11	152	6	Non-Combustible
MST45,5(R,RC,S,E)	150	6	152	6	Combustible
MST45,5(T,E)	150	6	152	6	Non-Combustible
MST42,44,46,47,54,4,6,7(R,RC,S,E)	356	14	152	6	Combustible
MST42,44,46,47,54,4,6,7(T,E)	356	14	152	6	Non-Combustible
MST17,24,34B	-	-	-	-	Combustible
MST35,70F	152	6	152	6	Combustible

CLEARANCE FROM NON-COMBUSTIBLE CONSTRUCTION					
MODEL	Sides		Rear		Base
	mm	Ins.	mm	Ins.	
All Models	0	0	0	0	Non-Combustible

# STATUTORY REGULATIONS

The installation of this appliance must be carried out by a competent person and in accordance with the relevant regulations, standards, codes of practice and the related publications of the Country of destination.

**AUSTRALIA SPECIFIC CLAUSE** This appliance must be installed in accordance with the manufacturers instructions, local gas fitting regulations and requirements of AS 5601 / AG 601 installation code. All burner adjustments and settings should be made by a qualified gas technician.

# INTRODUCTION

It is required by law that all gas appliances are installed by competent persons in accordance with the LOCAL GAS SAFETY REGULATIONS. Failure to install appliances correctly can lead to prosecution. It is in your own interests and that of safety to insure that there is compliance with the law.

We suggest installation, maintenance and repairs should be performed by your local authorized service agency listed in your information manual pamphlet.

**The following instructions should be read carefully as the manufacturer cannot be held responsible for any damage to property, persons or animals caused by incorrect installation or operation of the appliance.**

## Uncrating

Check crate for possible damage sustained during transit. Carefully remove the unit from the crate and again check for damage. Any damage to the appliance must be reported to the carrier immediately.

## Rating Plate Location

Every cooking unit has a rating plate. All burner input ratings are shown on the serial plate of each unit model the location of the plate is indicated in Table A

Table A.

MODEL WITH SUFFIX	LOCATION
R & RC	Behind the lower kick panel
S & B	In the storage cabinet on the left hand side panel
T	On the front panel

Knowing the equipment model is essential if spare parts are required or for discussing equipment problems with Garland's technical support staff. Table B lists the various models of heavy duty Ranges, Broilers & Fryers in Garland's gas operated Master series.

In the event you have any questions concerning the installation, use, care or service of the product, write or call our Product Service Department.

This product has been certified as commercial cooking equipment and must be installed by professional personnel as specified.

# INTRODUCTION continued

## Safety

If you smell gas

1. Turn off the appliance at the gas inlet cock and open all doors and windows.
2. Do not operate any electrical switches and extinguish all naked flames.
3. Contact the local gas authority immediately.

WARNING: do not store flammable materials in or near this appliance.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

Do not spray aerosols in the vicinity of this appliance while it is in operation.

## Optional Extras

- Pot rack
- Spreader plate
- Common front rail & back guard
- End unit
- Casters

# INSTALLATION

1. Carefully remove unit from carton. The wires or ties retaining the burners and other packing material must be removed from the unit. Any protective material covering stainless steel parts must also be removed.
2. All equipment is shipped from the factory with legs fitted, unless otherwise specified. Where the range is to be mounted on a dais or cove base, it is shipped without legs. Legs must be fitted to the oven where it is installed on a combustible floor.
3. The back splash or optional pot rack is packed separately.
4. The type of gas and supply pressure that the equipment was set up for at the factory is noted the data plate and on the packaging. This type of gas supply must be used.
5. Do not remove permanently affixed labels, warning or data plates from the appliance, for this may void the manufacturer's warranty.

## Gas Supply

The gas pipe connection is made at the left hand side or right hand side of the equipment. The size of the pipe work supplying the appliance must not be less than the inlet connection, which is 1 1/4" NPT.

NOTE: a 3/4" NPT single unit optional connection must be specified.

An isolating valve is recommended to be close to the appliance to allow shutdown during an emergency or routine servicing. After installation, be certain to check the complete pipe work for leakage.

## Electrical Supply

If 240V, the supply must be connected to the terminal block termination located at the rear of the range for models with suffixes R, RC, or the front for models with suffixes S or T.

For ease in attaching the supply line, there is a removable cover. A qualified electrician should make the connection to the mains in accordance with the applicable local codes

# COMMISSIONING

## Testing & Adjustments

Fittings and pipe connections: Check all pipe fittings and connections to the appliance for leaks. Use only approved gas leak detectors or soap solutions to check fitting and pipe connections. **DO NOT USE A FLAME.**

1. Turn all valves and thermostats to the OFF position.
2. Turn on the main gas supply valve and light the top section pilots.
3. Leak test the valves and fittings as described above, seal any leaks found and re-check to make sure the leak is sealed.
4. Light the oven pilot.
5. If the range is provided with an oven shut-off valve separate from the thermostat, turn this valve ON and set the thermostat at 250°C. Gas will now flow to the oven burner.
6. Leak test all valves and fittings, seal leaks and re-test.
7. Shut OFF all range valves and set the thermostat dials to the OFF position.

## Pressure Settings (All Models Except Fryers)

1. Make sure all gas taps are in the OFF position and turn on the main gas supply.
2. Light all pilots in accordance with the User's Instructions.
3. Connect a U-gauge manometer to the pressure test point on the main manifold and turn all gas controls to the ON or position.
4. Confirm that the pressure is the same as stated on the rating plate.

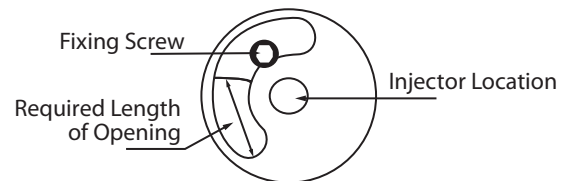
## Pressure Settings - Fryers

1. Connect a U-Gauge manometer to the pressure test point at the end of the burner manifold and check that the pressure setting is the same as stated on the rating plate.
2. If necessary, adjust the pressure using a screw driver to turn the adjusting screw on the gas control. Turn the control clockwise to increase pressure and counter.

## Burner Adjustments

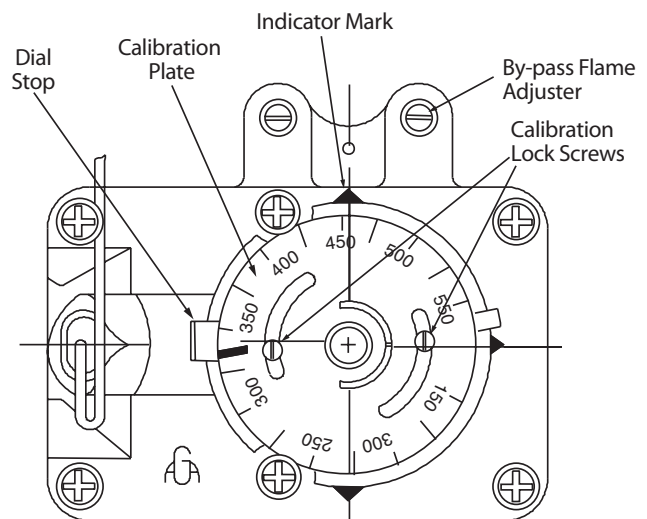
- Check that the air shutter is set to the required opening. Refer to Table H

Figure 1 – Air Shutter



## Thermostat Bypass Adjustment - Oven

Figure 2 – Oven Thermostat



With reference to Figure 2, the Robertshaw FDO snap-throttle thermostat requires a bypass adjustment. To adjust the bypass, follow this procedure.

1. Turn the oven temperature control dial to 200°F (93°C) then allow the oven to heat for 3 minutes.
2. Turn the oven control dial to the OFF position, then slowly turn the oven temperature control dial counter-clockwise until an audible click is heard.
3. Making sure not to disturb the oven temperature control dial, turn the bypass flame adjusting screw and adjust the bypass flame to the **LOWEST POSSIBLE STABLE FLAME COVERING THE ENTIRE PORTED AREA OF THE BURNER.** Turn the adjusting screw counter-clockwise to increase or clockwise to decrease the size of the bypass flame.

# COMMISSIONING continued

## Oven Thermostat Calibration

To check the calibration, follow this procedure:

- A. Place the thermocouple of the test instrument or a mercury thermometer in the center of the oven.
- B. Turn the oven control dial to 400°F (202°C) to allow the oven temperature to stabilize. Allow the oven to cycle twice before taking a test reading.
- C. Check the temperature reading when the control cuts down to bypass. If the temperature does not read within 15°F (5°C) of the dial setting recalibrate as follows.
- D. Remove the control dial, making sure not to disturb the setting.
- E. Hold the calibration plate and loosen the two calibration lock screws until the plate can be rotated independently of the control.
- F. Turn the calibration plate until the temperature indicated on the plate corresponds with the reading of a test instrument. Hold the plate and tighten the screws firmly.
- G. Repeat the temperature reading check when the control cuts down to bypass to make sure the correct adjustment has been made.

## Open Type Hot Plate

**A/S setting:**

1. Check that the air shutters are set at the required opening (see Figure 1).
2. Adjust the setting as necessary.

## Solid Top/Griddle

**A/S setting:**

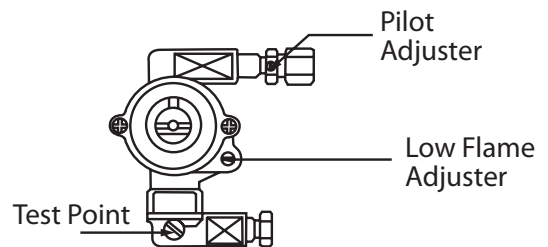
- Check to make sure that the air shutter is set to give the required opening. Adjust as necessary (see Figure 1). Refer to Table H

**Minimum flame setting:**

To obtain the minimum flame setting:

1. Set the gas valve to the MIN position.
2. Turn the set screw clockwise to reduce the flame and clockwise to increase it (see Figure 3).
3. The flame should be at the lowest stable flame across the burner.

Figure 3 – Minimum Flame Setting

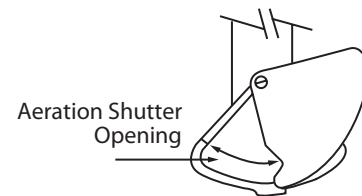


For MST models only

## Front Fired Solid Top

**Air shutter setting**

Figure 4 – Minimum flame setting

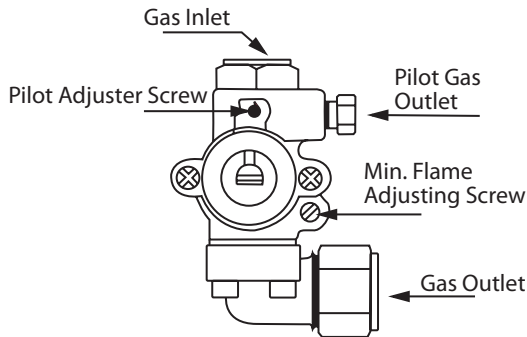


To obtain the minimum flame setting:

1. Set the gas valve to the MIN position.
2. Using a screwdriver, turn the adjuster on the valve body clockwise to reduce flame and counter-clockwise to increase it.
3. Adjust to achieve the minimum stable flame on the ported area of the burner.

# COMMISSIONING continued

Figure 5 – Minimum Flame Setting



For MST models only

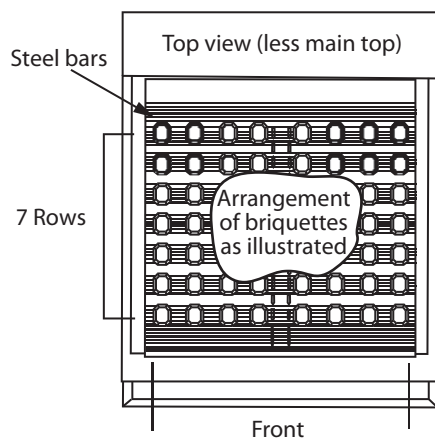
## Broiler Burner

To obtain the minimum flame setting:

1. Set the gas tap to the low ON position.
2. Using a screwdriver, turn the adjuster on the tap body clockwise to reduce pressure and counter-clockwise to increase it.
3. Adjust to achieve the minimum stable flame on burner.

The correct briquette arrangement is shown in Figure 6 following.

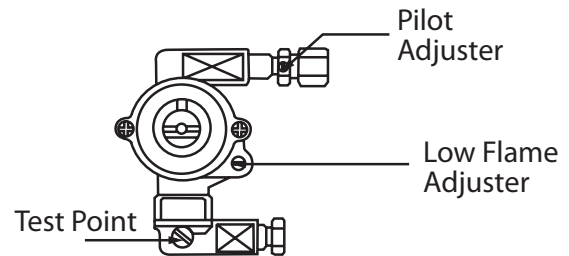
Figure 6 – Briquette Pattern



## Open Burners

1. Light the pilot light in accordance with the User's Instructions.
2. Check that the length of the flame is correctly at 7-12mm and adjust as necessary.

Figure 7 – Minimum Flame Setting

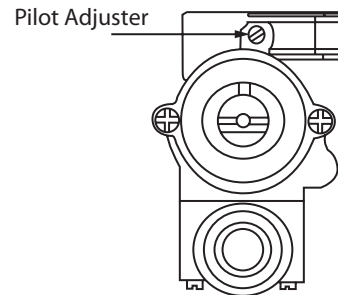


For the MST models only

## Oven

1. Open the lower kick panel.
2. Remove the oven base plate (on R models).
3. Light the pilot light in accordance with the User's Instructions.
4. Check that the length of the pilot light is 12mm.

Figure 8 – Minimum Flame Setting



For pilot light only



# COMMISSIONING continued

## Solid Hot Plate/Griddle

1. Light the pilot light in accordance with the User's Instructions.
2. Check that the length of the flame is 12mm and adjust as necessary (see Figure 7).

## Front Fired Hot Top

1. Light the pilot light in accordance with the User's Instructions.
2. Check that the length of the flame is 12mm and adjust as necessary (see Figure 5).

## Broiler

1. Light the pilot light in accordance with the User's Instructions.
2. Check that the length of the flame is 12mm and adjust as necessary (see Figure 7).

## Fryer

1. Light the pilot light in accordance with the User's Instructions.
2. Check that the length of the flame is 12mm and adjust as necessary.

When all the settings have been checked:

1. Remove the U-gauge manometer, replace the pressure test point screw, the valve panel, oven base plate and the lower kick panel.
2. Tell the user the location of the gas isolation cock for use in an emergency.
3. Instruct the owner or user of the equipment in the efficient and safe operation of the appliance.

# OPERATION

This section deals with equipment operating instructions. To find the operating instructions for a particular piece of equipment, consult the Table of contents.

## Open Top Burners (MST Models)

1. Push in the gas valve and turn it counter-clockwise to the ignition position.
2. Holding the valve fully in, light the pilot burner.
3. When the pilot burner is lit, continue holding the valve fully in for 20 seconds, then release it. If the pilot goes out, wait for five minutes, then repeat the start procedure.
4. When the pilot is established, push the valve in again and turn it counter-clockwise to the desired flame setting.
5. To shut off the burner, turn the dial to the '0' position and the safety device will disengage within 60 seconds.

## Hot Top And Spectro-top Sections (MST Models)

1. Push in the valve and turn it counter-clockwise to the IGNITION position.
2. Holding the valve fully in, light the pilot burner.
3. When the pilot burner is lit, continue holding the valve fully in for 20 seconds, then release it. If the pilot goes out, wait for five minutes, then repeat the start procedure.
4. When the pilot is established, push the valve in again and turn it counter-clockwise to the desired flame setting.
5. To shut off the burner, turn the dial to the '0' position and the safety device will disengage within 60 seconds.

# OPERATION continued

## Standard Ovens

1. Push in the main/pilot gas valve and turn it counter-clockwise to the IGNITION position.
2. Lower the front kick panel.
3. Holding the oven gas valve fully in, press the red piezo igniter button several times.
4. When the pilot burner is lit, continue holding down the oven gas valve for 20 seconds, then release it. If the pilot goes out, wait for five minutes and try again.
5. When the pilot light is established, push the gas valve in again and turn it counter-clockwise to the full ON position, then set the thermostat to the desired temperature.

### Shut Down:

1. Turn all valves to the OFF position and the safety device will disengage within 60 seconds.
2. If the unit is to be shut down for an extended time, close the in-line gas valve.

## RC Convection Ovens

**Power failure:** In the event of an electrical power failure, do not operate this oven. It is gas operated, but has electrical features, motor and door switches. A wiring diagram is attached to the rear of the appliance.

### Start Up:

1. Turn the power switch to the COOK position.
2. Turn the gas oven valve to ON.
3. Turn the thermostat to the designed setting.

### Cool Down:

1. Turn the thermostat and oven valve OFF.
2. Open the oven door.
3. Turn the power switch to the COOK DOWN position.

### Shut Down:

1. Turn the thermostat OFF.

2. Return the power switch to OFF.

3. Turn the oven valve OFF.

### Motor Care:

The motor on a convection oven is equipped with sealed, self-lubricating ball bearings and is maintenance free. It will give durable service when treated with ordinary care. Here are some operating notes.

1. When the motor is operating, it is cooled internally by air entering the rear of the motor case, provided proper clearance has been allowed. Ensure that rear of range has minimum 25 mm clearance around perimeter.
2. Because the blower wheel is in the oven cavity it is at the same temperature as the oven. If the motor is stopped while the oven is hot, heat from the blower wheel is conducted by the shaft to the motor armature. This can dramatically shorten motor life.
3. It is recommended that, at the end of the bake or roasting period when the oven may be idle or ready for shut-down the oven door be left open. Use the COOL-DOWN position on the fan switch, which keeps the fan operating for at least 20 minutes.

CAUTION: Never turn the fan OFF when the oven is HOT.

## Char-Broiler (MST Models)

1. Raise or remove the cooking grates. Every group of two burners has one pilot centrally located between them.
2. Push in the gas valve and turn it counter-clockwise to the Ignition position.
3. Holding the oven gas valve fully in, depress the red piezo igniter button behind the lower drop-down panel.
4. When the igniter is lit, continue holding down the oven gas valve for 20 seconds, then release it. If the pilot goes out, wait for five minutes and try again.
5. When the pilot light is established, push the gas valve in again and turn it counter-clockwise to the full ON position, then set the thermostat to the desired temperature.

## OPERATION continued

### Shut Down:

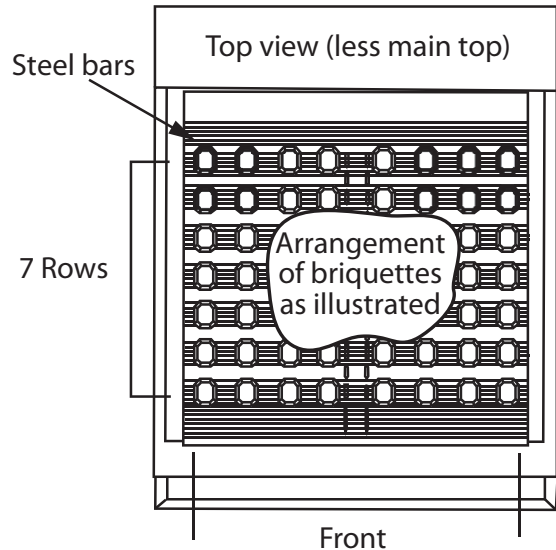
1. Turn all valves to the OFF position by rotating the knob clockwise 6 mm (1/4") turn.
2. If the unit is to be shut down for an extended time, close the in-line gas valve.

NOTE: Suffix E models are equipped with an electric spark ignition module for pilot burner ignition. Pushing the spark button will ignite all pilot burners simultaneously.

### Assembly Of Char-Broiler:

The broiler is supplied with 5/8" (16 mm) diameter steel rods to support the briquettes. The rods are installed in the grooves in the support bracket atop the main burners. If it is necessary to disassemble or replace damaged briquettes, follow the arrangement shown in Figure 9.

Figure 9– Briquette Pattern



## MAINTENANCE AND CLEANING

Proper maintenance, cleaning and care of cooking equipment is an important part of any program and will keep it in good operating condition. These notes provide a code of good practice for users to maintain a regular cleaning schedule

### Seasoning

#### Griddles

1. Remove any factory applied protective material by washing with hot water and a mild detergent or soap solution.
2. Apply a thin coat of cooking oil to the griddle surface in the proportion of about one ounce per square foot of surface area. Spread this over the entire surface with a cloth to create a thin film. Wipe off any excess oil with a cloth.
3. Light the burners and set them at the lowest setting. Some discoloring will occur when heat is applied to the steel.
4. Heat the griddle slowly for 15 to 20 minutes. Then wipe away the oil. Repeat this procedure three times or until the griddle has a slick, mirror-like finish. Continue doing this until the desired cooking temperature is reached.

#### CAUTION

Do not go to HIGH (on valve control) or 230°C (on thermostat control) during the seasoning period. If it is seasoned properly, the griddle will not require re-seasoning. If, however, the griddle is overheated and product begins to stick to the surface, it may be necessary to repeat the seasoning process.

# MAINTENANCE AND CLEANING continued

## Cast Iron Top Grates And Ring Grates

1. Move the grates from the range and wash them in warm water with mild soap. Then dry them with a clean cloth.
2. Immediately after drying, season the grates lightly with a non-toxic oil (a light vegetable oil, liquid or spray).

**WARNING:** Do not season top grates while they are still on the range top. A flash fire may result.

3. After seasoning, replace the top grates on the range and operate all the range top sections on LOW.
4. Allow the sections to operate for 20 minutes before using pots and pans on them.

**CAUTION:** To grates required seasoning whenever they have been cleaned. Failure to season them after cleaning will cause rusting.

## Cleaning

### Raw Steel Finishes:

Some parts of cooking ranges use steel with untreated surface finish (i.e., hot tops, griddles, springs, doors etc.). These parts can react with moisture and rust or corrode. This is normal and not considered a factory defect.

- Wipe away spills immediately.

### Painted Finishes:

1. Wipe away spills immediately.
2. Allow equipment to cool before cleaning exterior surfaces. Wipe exposed, cleanable surfaces with a mild detergent and hot water when the surfaces have cooled, not before. Remove stubborn residue spots with a lightweight non-metallic scouring pad and dry the surface thoroughly with a clean cloth.

### Stainless Steel Finishes:

1. For routine cleaning, use hot water and a mild detergent. Wash a small area at a time. Tackling a large area allows water to evaporate, leaving chemicals that lead to streaking. Rinse the washed area with a clean sponge dipped in a sanitizer, and wipe it dry with a soft cloth before it can dry by evaporation.

2. Use a paste of water and mild scouring powder if necessary, but always with the grain, not against it. Stainless steel is polished in one direction, so clean in the same direction as the grain to preserve the finish. Thoroughly rinse and dry with a soft cloth.
3. To avoid the appearance of fingerprints, several stainless steel polishes are commercially available that leave an oily or waxy film. Do not use them on surfaces that will be in contact with food.
4. Stainless steel may discolor if overheated. These stains may be removed by vigorous rubbing with a scouring powder paste or Scotchbrite pad.

**CAUTION:** Use only stainless steel, wooden or plastic tools only if it is necessary to scrape off heavy deposits of food and oil. On no account use ordinary steel scrapers or knives for this purpose as iron particles may become imbedded in the stainless steel and lead to corrosion. Never use steel wool on stainless steel surfaces. It destroys the finish. Hot water or a mild solution of bleach will sanitize stainless steel without ill effect.

### Oven Interiors (Porcelain Enamel):

**WARNING:** Before cleaning the inside surface of a range, unplug the power supply.

1. Before cleaning an oven interior, remove the racks and guides. Clean the oven racks and guides with a mild soap and warm water solution, or pass them through a dish washer.
2. Clean the porcelain enamel surface daily, using a soap solution. At least once a week clean the oven thoroughly with a detergent or any commercial oven cleaner recommended for use with porcelain enamel, but only when the oven is cold.

### Griddles

**CAUTION:** Do not use water on griddle tops while they are hot. Do not try to cool a griddle with ice. This will warp the plate and may cause it to crack.

To maintain evenly cooked, perfectly browned griddle products, keep the griddle free from carbonized grease. Carbonized grease hinders the transfer of heat from the griddle surface to the food product. This results in uneven browning and loss of cooking efficiency. Carbonized grease also clings to griddle foods, giving them a highly unsatisfactory and unappetizing appearance. To keep a griddle clean and maintain it at peak operating performance, follow this procedure.

# MAINTENANCE AND CLEANING continued

1. After each use, clean the surface thoroughly with a grill scraper or spatula. Wipe off debris left over from the cooking process.
2. Daily: Clean the surface with a grill brick or pad. Remove, empty and clean the grease container thoroughly.
3. Weekly: Clean the surface well with a grill brick or pad. Rub with the grain of the metal while it is still warm. A detergent may be used on the plate surface to help clean it, but make sure it is removed. After cleaning, cover the surface with a thin film of oil to prevent rusting.
4. Use a non-abrasive cleaner to remove discoloration. Before using the griddle again it must be re-seasoned. On models without a side grease container, keep the griddle drain tube to the grease container clear.

**CAUTION:** The griddle plate is steel, but the surface is relatively soft and can be easily scored and dented by the careless use of a spatula. Dents, scratches and gouges in the surface will cause food to stick.

## Open Top Burners

1. Periodically, remove burners and clean them with soap and hot water.
2. Soak the burner in a bucket of hot soapy water and brush off any burnt-on grease or debris. Make sure the burner is thoroughly dry before re-installing it on the range.
3. If the burner ports are blocked or plugged with grease, clear them with a wire brush or pointed instrument.

## Cast Iron Top Grates And Ring Grates

1. Clean with hot water and a mild detergent. Use a wire brush to remove baked-on food particles.
2. Lightly coat with vegetable oil to help prevent rusting.

**CAUTION:** To grates required seasoning whenever they have been cleaned. Failure to season them after cleaning will cause rusting.

## Cast Iron Even Heat Hot Tops And Spectro-Heat Tops

**CAUTION:** Do not use water on tops while they are hot, or use ice to cool them.

1. While the surface is still slightly warm, wipe it with a clean burlap cloth. Scrape off the burnt-on spillage.

2. Remove the plate and wash it with soap and hot water. Dry it and apply a thin coating of oil to inhibit rusting. Excessive use of water could damage the surface and the controls below.

**NOTE:** The surface of Cast Iron Hot Tops and Spectro-Heat Tops will tone (a blue-brown discoloration) from heat. This does not diminish the cooking operation and is not a defect

## Adjustments

### Top and Oven Orifices

Top and oven orifices are fixed and cannot be adjusted. A proper rate is attained if the gas supply pressure is correct. Use the 1/8" NPT manifold pressure tap to check the pressure. A well-adjusted air shutter will provide for a distinct blue flame over the entire port area of the burners when they are operating at full rate.

### Pilot Adjustment

Individual pilot adjustment valves are mounted on the range top manifold.

1. Adjust the open burner pilot so that the tip of the flame reaches the middle of a flash tube opening. This flame may show a slight yellow tip, particularly when used on propane gas.
2. The pilot burner for the griddle or top burner should provide rapid ignition of the burner, but should not impinge on any part of the burner. When correctly adjusted, it should not lift off the burner nor show a yellow tip.

### Burner Gas/Air Adjustments

Ideal flames vary depending on the type of burner considered., although a sharp blue flame at full rate is typical.

To adjust burners, proceed as follows:

1. On the burner (star, Griddle, knuckle, broiler, oven burners) locate the air shutter. This found at the inlet to the burner venturi.
2. Loosen the lock-nut so that the air shutter turns freely.
3. If required, re-install the burner, turn on the gas flow and ignite the burner.

## MAINTENANCE AND CLEANING continued

4. Rotate the air shutter to obtain the following:
  - a. Open (star) burner – 12 mm stable, sharp inner blue cones.
  - b. Hot tops, griddles – 8 mm stable, sharp inner blue cones.
  - c. Knuckle burners – 8 mm stable, blue flame.
  - d. Charbroiler burners – 12 mm stable, blue flame.
5. If the burner flames are sharp and lift off the burner ports, reduce the primary air by closing the air shutter.
6. If the burner flames are lazy and yellow in appearance, increase primary air by opening the shutter.
7. If poor burner performance persists, check for proper gas pressure.

## CONVECTION OVEN (RC) – OPERATING TIPS

The following notes are a guide for the use of convection ovens.

1. Set oven temperatures 5°C to 10°C lower than recipes specify for the use of standard ovens. The cooking time may also be less, depending on the product, but two to five per cent less cooking time is a general rule. This needs to be checked for first time.
  2. Cooking time and oven temperature will vary depending on the size of the load, the temperature of the product, mixture of the recipe and, in particular, the moisture content of the product.
  3. When a satisfactory cooking time and temperature for a particular product is established, make a record for future use.
  4. Preheat the oven before use. To reach 175°C takes about 15 minutes. For the best results, pre-heat the oven for 30 minutes to allow for thorough heat saturation.
  6. Set the product in the center of the oven for the best heat circulation.
  7. A convection oven will hold three 450mm x 660mm sheet pans, six 305mm x 500mm x 63mm steam table pans or one 530mm x 450mm x 175mm roast pan with cover.
  8. Never place pans directly on to the oven bottom. Always use the lowest rack position which allows the air to circulate within the oven cavity.
  9. Load and unload food as quickly as possible to prevent an excessive drop in temperature.
  10. Avoid the use of warped pans because level pans bake more evenly.
  11. Do not use a deep pan for shallow cakes, cookies, etc., as circulation across the surface is essential for even cooking and browning.
  12. To prevent excessive shrinkage, roast meats at a low temperature: 120°C to 160°C.
  13. When re-thermalizing frozen products, pre-heat the oven 10°C higher than the cooking temperature to compensate for heat loss during and after loading.
- NOTE: The thermostat must be returned to the cooking temperature after loading.
14. To conserve energy, turn the oven off and allow it to cool down when not in use.

# SERVICING

Regular maintenance and servicing by competent and qualified personnel is recommended for the continued safe and efficient operation of cooking equipment.

**WARNING:** Before working on any appliance, SHUT OFF the gas supply at the main shut-off valve and electrical supply at the main disconnect. On completion of any servicing work, test for gas leaks before returning the equipment into service.

## Cleaning/Servicing Burners

### Open-type Burners

- 1 Lift and remove the pan supports and hot plate top section.
- 2 Lift the front burner to disengage the locating peg and slide it backwards off the orifice.
- 3 Remove the rear burner in the same manner.
- 4 Clean the burners in hot soapy water with a stiff scrubbing brush.
- 5 Rinse the burners and shake them well to removed the water.
- 6 Make sure the gas ports are free of debris. Clear ports of debris if necessary.
- 7 Reassemble the units in reverse order.

### Front Fired Solid Top Burners

- 1 Remove the key plates from the top of the range.
- 2 Lift the burner to disengage the locating peg and slide it backwards off the orifice.
- 3 Clean the burners in hot soapy water with a stiff scrubbing brush.
- 4 Rinse the burners and shake them well to remove the water.
- 5 Make sure the ports are free of debris. Clear ports of debris if necessary.
- 6 Reassemble the burners in reverse order.

### Solid Hot Plate/Griddle Burners

- 1 Lift off the griddle or solid plates as applicable.
- 2 Lift the rear of the burner and slide it backwards off the orifice.
- 3 Clean the burners in hot soapy water with a stiff scrubbing brush.
- 4 Rinse the burners and shake them well to remove the water.
- 5 Make sure the ports are free of debris. Clear ports of debris if necessary.
- 6 Reassemble the burners in reverse order.

### Oven Burners – Models With Suffix R

- 1 Remove the oven base plate.
- 2 Remove the two screws that secure the front air shield in place and lift out.
- 3 Slide the burner towards the rear, off the orifice fitting, and remove from oven.
- 4 Clean the burner in hot soapy water with a stiff scrubbing brush.
- 5 Rinse the burner and shake them well to remove the water.
- 6 Make sure the ports are free of debris. Clear ports of debris if necessary.
- 7 Reassemble the unit in reverse order.

### Oven Burners – Models With Suffix RC

- 1 Open the lower kick panel.
- 2 Remove the left hand oven door spring.

**CAUTION:** The oven door may need additional support to remain closed.

- 3 Remove the left hand front radiation shield.
- 4 Remove the two screws that secure the front air shield in place and lift it out.



# SERVICING continued

5. Slide the burner to the rear and off the orifice. Then slide it to the left and remove it from the combustion chamber.
6. Clean the burner in hot soapy water with a stiff scrubbing brush.
7. Rinse the burner and shake it well to remove the water.
8. Make sure the ports are free of debris. Clear ports of debris if necessary.
9. Reassemble the unit in reverse order.

## Broiler

1. Remove the top plates.
2. Remove the briquettes.
3. Remove the front pilot drip shield and the briquette support rods.
4. Lift the rear of the burner and slide it to the rear and off the orifice.
5. Clean the burners in hot soapy water with a stiff scrubbing brush.
6. Rinse the burners and shake them well to remove the water.
7. Make sure the ports are free of debris. Clear ports of debris if necessary.
8. Reassemble the unit in reverse order.

## Pilot Burner Cleaning

### Hot Plate/Solid Top/Griddle/Broiler

1. Remove the main burners. Refer to the appropriate section on burner cleaning.
2. Disconnect the pilot gas supply pipe from the pilot burner.
3. Remove the pilot burner.
4. Clean the pilot burner by blowing through it or washing it.

CAUTION: Do not use wire to clear the pilot burner. It might damage the unit.

5. Reassemble the pilot burner in reverse order.

## Oven

1. Open the drop-down lower kick panel.
2. On all models but RC units, remove the oven base plate. (To deal with RC models, follow the procedure specified for the burner cleaning instructions.)
3. Remove the two screws securing the front air shield and remove it from the oven.
4. Disconnect the pilot gas supply pipe.
5. Remove the pilot burner from the pilot burner.
6. Clean the pilot burner by blowing through it or washing it in water.

CAUTION: Do not use wire to clear the pilot burner. It might damage the unit.

7. Reassemble the unit in reverse order.

## Fryer

1. Open the compartment door and disconnect the pilot gas supply pipe from the combination gas valve.
2. Remove the screws that fasten the pilot to the mounting bracket and remove the pilot burner.
3. Remove the pilot burner from the pilot burner.
4. Clean the burner by blowing through it or washing it in water.

CAUTION: Do not use wire to clear the pilot burner. It might damage the unit.

5. Reassemble the unit in reverse order.

## Thermostat Calibration

### Oven

CAUTION: Remember to check the bypass every time the oven is recalibrated (refer to the entry on Thermostat bypass).

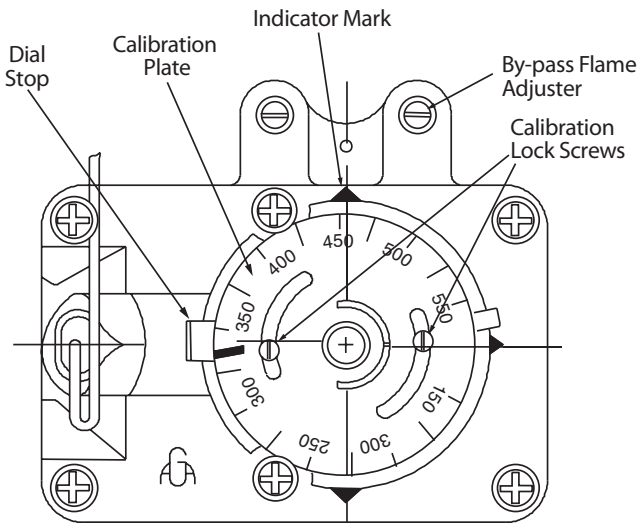
Recalibration of the oven thermostat is seldom necessary and should not be attempted unless the cooking results definitely prove that the thermostat is not maintaining the temperatures to which the dial is set. Use a reliable temperature indicator when checking the oven temperature. To calibrate an oven thermostat, follow this procedure.



## SERVICING continued

1. Place the thermocouple of the test instrument in the center of the oven.
2. Light the oven, set the thermostat to 400°F (204°C) and wait 15 minutes for the oven temperature to stabilize.
3. Check the temperature at 5 minute intervals until three successive readings are within  $\pm 5^\circ\text{F}$  ( $\pm 3^\circ\text{C}$ ) of each other.
4. If the temperature is not within  $\pm 20^\circ\text{F}$  ( $\pm 8^\circ\text{C}$ ) of the thermostat dial setting, refer to Figure 10 to recalibrate using this procedure.

Figure 10 – Oven thermostat



6. Remove the thermostat dial, making sure not to disturb the setting.
7. Hold the calibration plate and loosen the two calibration locking screws.
8. Turn the calibration plate counter – clockwise to increase the oven temperature or clockwise to decrease it.

NOTE: One division of the calibration plate is equal to  $25^\circ\text{F}$  ( $14^\circ\text{C}$ ).

9. Hold the plate and tighten the screws.
10. Replace the thermostat dial.
11. Recheck the calibration as specified in this procedure to confirm that the correct adjustment has been made.

### Fryer

The same observation made about oven thermostats applies to fryers. That is, recalibration of the thermostat is seldom necessary. If experience with the cooking results proves that the temperature at which the dial is set is incorrect, follow this procedure to re-calibrate the thermostat. Use a reliable thermometer only or, preferably, a pyrometer.

1. Suspend the thermometer or thermocouple in the middle of the fry tank about 2" (76mm) below top level of oil.
2. Allow the burner to cycle four times.
3. When the burner cycles OFF after the fourth cycle, compare the reading of the thermometer or thermocouple with the thermostat setting.
4. If the two readings are not within  $\pm 5^\circ\text{F}$  ( $\pm 3^\circ\text{C}$ ) of one another, loosen the two set screws in the thermostat knob and set the pointer of the thermostat to agree with the reading of the test thermometer or thermocouple.
5. Tighten the set screws on the thermostat knob after resetting the pointer.

# REPLACEMENT OF PARTS

For replacement parts, users and service personnel are referred to Garland's *Master Series Heavy-duty Ranges and Attachments parts list*. This section of the service manual deals only with the replacement of parts on heavy duty cooking equipment.

**WARNING:** Before servicing any cooking appliance be certain to SHUT OFF the gas supply at the shut-off valve and the electrical supply at the main disconnect. On completion of any servicing work, test for gas leaks before returning the equipment into service. Regarding electrical work, always shut off the electrical supply at the mains and secure the breaker of panel with a lock before doing electrical work. Do not service electrical equipment until the power is securely locked off.

## Gas Taps

1. Remove the knob of each gas valve and thermostat on the unit.
2. Remove the two securing screws on the valve panel and remove it.
3. Disconnect the thermocouple connection at the gas valve (MST units only).
4. Disconnect the pressure fitting at the main manifold to the inlet of the gas valve and remove it.
5. Fit a replacement gas valve.
6. Reassemble the unit in reverse order.

## Oven Thermostat

1. Remove the knob of each gas valve and thermostat on the range.
2. Removed the two securing screws on the valve panel and remove it.
3. Disconnect the thermocouple connection at the oven gas valve outlet.
4. Open the lower front panel and remove the right hand corner column from the range.
5. Remove the two thermostat mounting screws and pull the thermostat and tubing forward to gain access to the rear of the thermostat where the inlet and outlet connections are to be found.
6. Disconnect the pipe work between the oven gas valve and the thermostat.

7. Disconnect the oven gas supply pipe from the outlet of the thermostat.
8. Release the thermostat sensor retraining clips from the oven lining and the sensor from the clips.
9. Withdraw the thermostat sensor from the oven compartment.
10. Fit the replacement thermostat and reassemble the unit in reverse order.

## Pilot/Thermocouple/ Spark Electrode

### Hot Plate (MST Only)

1. Remove the burners using the procedure given in the previous section on burner cleaning.
2. Remove the screws securing the valve panel and remove the panel.
3. Disconnect the thermocouple connection at the gas valve.
4. Disconnect the pilot tube connection at the gas valve.
5. Remove the screws that secure the pilot burner mounting bracket and remove the pilot burner, thermocouple or spark electrode as the case may be.
6. Replace the faulty component and reassemble in reverse order.

### Griddle/Solid Top/Front-Fired Hot Top/Broiler

1. Remove the burners using the procedure given in the previous section on burner cleaning.
2. Remove the screws securing the fascia panel and remove the panel.
3. Disconnect the thermocouple connection at the gas valve.
4. Disconnect the pilot tube connection at the gas valve or thermostat (MST only).
5. Remove the screws that secure the pilot mounting bracket to the insert box and remove the pilot.
6. Replace the faulty component and reassemble the unit in reverse order.

# REPLACEMENT OF PARTS continued

## Oven

1. Remove the screws securing the valve panel and remove the panel.
2. Disconnect the thermocouple connection at the gas valve.
3. Disconnect the pilot tube connection at the gas valve or thermostat.
4. Open the lower kick panel.
5. Remove the screws securing the left hand corner column (or channel and grease bucket on griddle models) and remove the column.
6. Remove the oven base plate. (For RC models, refer to the previous section under burner cleaning.)
7. Disconnect the pilot gas supply pipe at the pilot burner.
8. Remove the screws that secure the pilot mounting bracket to the oven burner support.
9. Remove the pilot assembly.
10. Replace the faulty component and reassemble the unit in reverse order.

CAUTION: Don't not over-tighten the connection between the thermocouple and the flame safety device. It is sufficient for it to be finger tight plus a quarter of a turn.

## Spark Ignition Module Models With Suffix E:

1. Open the lower kick panel (cabinet door on broilers) and storage base panels.
2. Remove the right hand corner column. On broilers and storage units, remove the spark module enclosure cover at the lower right hand front of the storage cabinet.

3. Disconnect the wires from the valves on the ignition module.
4. Remove the screws that secure the module.
5. Replace with a new module and reassemble the unit in reverse order.

## Push Button Spark Switch Models With Suffix E

1. Open the lower kick panel. (Remove the valve panel on broilers).
2. Remove the right hand corner column. On broilers, remove the spark switch enclosure cover behind the front fascia panel.
3. Disconnect the wires from the taps on the switch.
4. Depress the tabs on the body of the switch and push the switch through the column opening. (On broilers, it is the mounting cover.)
5. Fit a replacement switch and reassemble the unit in reverse order.

## RC Oven

### Power Switch

1. Remove the front valve panel.
2. Remove the right corner column.
3. Disconnect the wires from the taps on the switch.
4. Depress the tabs on the body of the switch and push the switch through the column opening.
5. Fit a replacement switch and reassemble in reverse order, ensuring wires are attached correctly.

# CONVERSION INSTRUCTIONS

Servicing must be carried out by a competent person in accordance with the law.

**WARNING:** Turn off the gas supply to the appliance at the service cock before commencing any servicing work.

**IMPORTANT:** Test for gas soundness on completion of any servicing work.

The following instructions are intended to describe the operations necessary to convert equipment from operation on one gas family to that of another.

1. Ensure that all of the parts necessary to make the conversion have been supplied as follows:
  - a. Injector fittings ( One required for each main burner ).
  - b. Pilot injector fittings ( One required per pilot burner ).
  - c. Gas adjustment label ( One required per unit ).

If any of the required parts are missing, contact your Garland dealer before attempting to carry out the conversion.

**NOTE:** Conversion kits supplied for G31 gas will contain redundant fittings and markings covering both 37 mbar & 50 mbar gas supplies.

2. Remove the burners following the instructions given in this manual.
3. Replace each injector fitting with the new fitting that is supplied.

**NOTE:** Before doing so, refer to Table F (Table I for Australian Models) in this manual to ensure that the correct injector has been supplied for the gas supply being converted to.

4. Replace each pilot injector fitting with the new fitting supplied.

**NOTE:** There are two sizes of pilot injectors identified as follows:

- a. # 32 (2nd family gases) Natural Gas.
- b. # 23 (3rd family gases) Propane.

Ensure that you have the correct pilot injector before replacing.

Upon completion of all the above operations, follow the section in the manual on "Commissioning" and ensure that the setting pressure and all burner flame settings are adjusted accordingly.

**Continuous product improvement is a Garland policy, therefore specifications and design are subject to change without notice.**

# TROUBLE SHOOTING GUIDE

## Open Type Hot Plate, Solid Hot Top, Griddles And Broilers

PROBLEM	POSSIBLE CAUSE	SOLUTION
Burner flame too large.	Incorrect setting pressure or injector.	Check the setting pressure and injector.
Burner flame soft-yellow tip.	Insufficient primary air.	Check aeration shutter setting.
Flame lifts off burner ports.	Excessive primary air.	Check aeration shutter setting.
Flame lights back to injector.	Excessive primary air.	Check aeration shutter setting.
Burner 'pops' when turned off.	Excessive primary air.	Check aeration shutter setting.
Delayed ignition	Pilot flame too small.	Check length of pilot flame.
	Burner ports blocked	Clean burner
	Incorrect aeration.	Check aeration shutter setting.
	Incorrect setting pressure.	Check setting pressure.
Pilot burner will not ignite.	Pilot orifice blocked.	Clean jet.
	Pilot adjusting screw closed	Open and adjust flame length.
No spark to pilots.	Disconnected or loose hi-tension wires.	Reconnect hi-tension wires.
	Defective spark module.	Replace module.
	Defective momentary switch.	Replace switch.
	No power to range.	Check and restore power supply.
Pilot keeps going out.	Pilot flame too small.	Check pilot flame length.
	Loose thermocouple connection.	Tighten connection.
	Faulty thermocouple.	Replace thermocouple.
	Faulty flame safety device.	Replace flame safety device.
Low millivolt output on open circuit tests.	Pilot flame too small.	Adjust pilot flame length.
	Defective thermocouple.	Replace thermocouple.
Low millivolt output high in open circuit test, but low in closed circuit test.	Faulty flame safety device.	Replace flame safety tap.
Millivolt output high on closed circuit test, but flame safety tap will not stay open.	Faulty flame safety device.	Replace flame safety tap.

## Standard And Convection Ovens

PROBLEM	POSSIBLE CAUSE	SOLUTION
Oven too hot or not hot enough.	Thermostat out of calibration.	Check calibration.
Burner flame too large.	Incorrect setting pressure or injector.	Check the setting pressure and injector.
Burner flame soft-yellow tip.	Insufficient primary air.	Check aeration shutter setting.
Flame lifts off burner ports	Excessive primary air.	Check aeration shutter setting.
Burner 'pops' when turned off.	Excessive primary air.	Check aeration shutter setting.
Delayed ignition.	Pilot flame too small.	Check length of pilot flame.
	Burner ports blocked	Clean burner
	Incorrect aeration.	Check aeration shutter setting.
	Incorrect setting pressure.	Check setting pressure.
Pilot burner will not ignite.	Pilot orifice blocked.	Clean jet.
	Pilot adjusting screw closed	Open and adjust flame length.
No spark to pilots.	Disconnected or loose hi-tension wires.	Reconnect hi-tension wires.
	Defective spark module.	Replace module.
	Defective momentary switch.	Replace switch.
	No power to range.	Check and restore power supply.
Pilot keeps going out.	Pilot flame too small.	Check pilot flame length.
	Loose thermocouple connection.	Tighten connection.
	Faulty thermocouple.	Replace thermocouple.
	Faulty flame safety device.	Replace flame safety device.

## TROUBLE SHOOTING GUIDE continued

PROBLEM	POSSIBLE CAUSE	SOLUTION
Low millivolt output on open circuit tests.	Pilot flame too small.	Adjust pilot flame length.
	Defective thermocouple.	Replace thermocouple.
Low millivolt output high in open circuit test, but low in closed circuit test.	Faulty flame safety device.	Replace flame safety tap.
Millivolt output high on closed circuit test, but flame safety tap will not stay open.	Faulty flame safety device.	Replace flame safety tap.
Door will not stay closed.	Insufficient tension on springs.	Adjust tension.
	Broken spring.	Replace spring.
	Broken hinge link.	Replace.
Door will not stay open.	Too much tension on springs.	Adjust tension.
Door not closing on one side.	Door warped.	Replace door.
Door not level or low in center.	Trunnion support loose.	Level and tighten.
	Trunnion support worn.	Replace.

### Standard Oven Only

PROBLEM	POSSIBLE CAUSE	SOLUTION
Burner flame shuts off when oven is at required temperature.	Thermostat has incorrect bypass rate.	Adjust bypass or replace thermostat.

### Convection Base Oven Only

PROBLEM	POSSIBLE CAUSE	SOLUTION
COOK/COOL DOWN switch set to COOK position. Light off. Motor working.	No power to oven.	Check power supply
	Defective COOK/COOL DOWN switch.	Replace switch.
	Faulty wiring.	Check condition of wires and connections.
COOK/COOL DOWN switch set to COOK position. Light off. Motor not working.	Defective COOK/COOL DOWN switch.	Replace switch.
	Defective door switch.	Replace switch.
	Door switch out of alignment.	Align switch.
	Oven door open.	Close door.
	Faulty wiring.	Check condition of wires and connections.
COOK/COOL DOWN switch set to COOK position. Light on. Motor not working	Defective motor.	Replace motor.
	Main ON-OFF/pilot gas valve set to OFF.	Turn gas valve to FULL ON position.
Thermostat set to temp. Pilot on but oven not heating.	Gas solenoid valve not opening.	Defective thermostat.
	Defective solenoid valve.	Replace solenoid.
Noisy motor.	Blower wheel rubbing on oven baffle.	Adjust blower wheel.
	Blower wheel loose on motor shaft.	Tighten blower wheel.
	Defective motor.	Replace motor.
COOK/COOL DOWN switch set to COOL position. Light on. Motor not working	Defective COOK/COOL DOWN switch.	Replace switch.
	Defective door switch.	Replace switch.
	Door switch out of alignment.	Align switch.
	Faulty wiring.	Check condition of wires and connections.

# TROUBLE SHOOTING GUIDE continued

## Fryers

PROBLEM	POSSIBLE CAUSE	SOLUTION
Low millivolt output.	Low pilot flame.	Adjust pilot flame length.
	Clogged pilot orifice.	Clean orifice.
	Low gas pressure.	Increase pressure at regulator.
	Manual shut-off partially closed.	Open valve fully.
	Flame blowing away from power pile.	Adjust flame back to power pile.
	Pilot flame adjusted too high.	Reduce flame by using pilot adjusting screw on automatic gas valve.
	Power pile not inserted all the way into the pilot.	Insert until flame covers 3/8" to 1/2" of generator thermocouple tip.
	Defective generator or thermocouple.	Replace.
Good output, but low reading at valve.	Loose, dirty or corroded terminals.	Clear or tighten as required.
	Broken or disconnected head wire.	Reconnect or replace lead wire.
Output high with main burner off-low with it on.	Main burner over-gassed.	Reduce pressure at automatic gas valve to appropriate pressure as specified on nameplate.
	Defective pilot magnet.	Replace automatic gas valve.
	Defective Hi-limit.	Replace H-limit.
Output good, but pilot magnet will not hold.	Loose, dirty or corroded terminals.	Clear or tighten as required.
	Manual valve not fully open.	Open valve.
	Defective pilot magnet.	Replace automatic gas valve.
	Defective H-limit.	Replace Hi-limit.
Main burner will not come on though pilot remains lighted.	Loose, dirty or corroded terminals	Clean or tighten as required.
	Manual valve not fully open.	Open valve.
	Defective automatic gas valve.	Replace automatic gas valve.
	Thermostat out of calibration.	Calibrate thermostat.
	Defective thermostat.	Replace and calibrate.
Burner does not light all the way around. (Delayed ignition.)	Vent line, if used, plugged.	Remove and clean thoroughly.
	Deflector bracket out of adjustment.	Re-align bracket.
	Ceramic target broken or missing.	Replace target.
	One or more orifices clogged.	Clean orifices.
	Flue connected directly to stack.	Remove stack and allow at least 18" space between flue and grease filters.

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